on known drug metabolic routes suggests that a clinically significant interaction is unlikely with the following:
aminoglycosides
amphotericin
AZT (no dose adjustment needed)
cidofavir
dapsone
foscarnet
ganciclovir
sulphonamides

(3) Clarithromycin has a large therapeutic index and no dose changes are recommended beyond the usual reduction in renal failure.

As a summary, this chart may create problems in that it excludes not only potentially hazardous agents but also those that are of use. An omission from the list could be seen to endorse or discredit the drug.

All the antivirals listed have drugs contraindicated for co-administration. A reference should be made to these on the chart or, at least, for the prescriber to refer to the summary of product characteristics for them.

Appreciating the need for brevity, a number of useful agents are not covered from groups such as antibacterial, antimycobacterial, and gastrointestinal drugs.

Drugs with significant interactions include:

(1) Anticonvulsants—levels of various anticonvulsant drugs are altered and need monitoring. These include phenytoin, carbamazepine, and phenobarbitone (levels increase and ritonavir levels decrease); lamotrigine and valproate (levels decrease).

(2) Psychotropics—levels of various psychotropics are increased and again require monitoring. These include:
chlopromazine
fluoxetine
fluvoxamine
haloperidol
maprotiline
paroxetine (avoid)
thioridazine
trazodone
most tricyclics

(3) Itraconazole, miconazole, and ketoconazole levels are increased with a reduction in ritonavir levels. A dose reduction of 50% is suggested.

The symbols used are ingenious but could be misconstrued. The meaning of the skull and crossbones is unclear and could generate unwarranted alarm. From the cluster of agents listed with astemizole it would seem to indicate a contraindication. This clearly is not the case with the oral contraceptive in which pill failure is the issue. The double exclamation marks with food indicate the 15% increase in absorption but this is a useful effect and is advised in the prescribing regimen.

It may also be prudent to indicate that where boxes are left blank this only represents the extent of current data.

Having maintained a stance of reporting all known and theoretical interactions from the earliest stage of clinical drug usage, it is easy to appreciate the complexities involved with compiling interaction charts with this drug class. However, this may actually increase the hazards of such a format. Prescribers will have a natural tendency to latch on to any comprehensible summaries in preference to more complex data or cross reference to the accompanying text.

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1 Heylen R, Miller R. Review: Adverse effects and drug interactions of medications commonly used in the treatment of adult HIV positive patients: Part 2. *Genitourin Med* 1997;73:5–11.

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Reply

We agree with Dr Simmonds that the subject of drug interactions between antiretrovirals and other drugs is an intricate and increasingly complex subject.

All the statements made in our articles[1 2] were explained in the text as well as displayed visually in the tables and were also supported by references.

The information contained in our article about ritonavir came from several sources, but mainly the 'Norvir' product information sheet for August 1996. Since our article has been published, knowledge about the drug actions and interactions of ritonavir has increased substantially. We are grateful to Dr Simmonds for highlighting some of these new data.

Our intention in creating our adverse effects and drug interaction articles[1 2] with their accompanying visual displays and text explanations of the symbols deployed was to provide the busy clinician in outpatient departments or in the ward setting with the resource to aid identification of major drug effects and interactions. Articles such as ours are not meant to supplant, rather they should complement the important role of hospital pharmacy drug information teams, product information sheets, and drug company medical information departments. We feel that any source of information about drug interactions in HIV/AIDS can only be of benefit to physicians, pharmacists, and to patients themselves.

Faced with this increasingly complex subject, we have begun to develop a computer program to aid physicians and pharmacists in safe prescribing of drugs commonly used in the treatment of adult HIV positive patients.

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1 Heylen R, Miller R. Adverse effects and drug interactions of medications commonly used in the treatment of adult HIV positive patients: Part I. *Genitourinary Med* 1996;72:237–46.
2 Heylen R, Miller R. Adverse effects and drug interactions of medications commonly used in the treatment of adult HIV positive patients: Part II. *Genitourinary Med* 1997;73: 5–11.

MATTERS ARISING

Control of sexually transmitted diseases in Ghana: the real issues!

Sexually transmitted diseases (STDs) constitute a major public health problem in developing countries. However, most developing countries lack an effective and broad based control programme.[1] This paper discusses some pertinent problems of STD control in Ghana which may be relevant to other developing countries.

The establishment of a national AIDS control programme (NACP) in Ghana in 1986 gave prominence to the control of STDs. Although a separate STD control programme was set up, donors were generally more interested in HIV/AIDS control. It is only since September 1995 that the two programmes have been integrated with one national coordinator. However, the integration has not been completely effected in some regions of the country. STDs and HIV share common transmission routes and control strategies; hence, developing integrated control programmes makes for increased cost effectiveness, impact, and sustainability.[2] Improved treatment of STDs has been shown to reduce the incidence of HIV by 42%.[3] Specially funded annual events such as the AIDS Awareness Month campaigns while they lead to increased condom sales in the short term may not be sustainable in the long term. The collaboration between the NACP and the Ghana Social Marketing Foundation has been more helpful for the promotion of condom use.

Whereas the NACP has a surveillance system in place that includes regular HIV sentinel surveillance among pregnant women and patients attending STD clinics, the STD programme only relies on partial morbidity records from health institutions. Gonorrhoea is the only reportable STD in Ghana; other STDs in women are believed to be reported as "gynaecological disorders".

Problems associated with drug management of STDs include high prevalence of self medication, increasing resistance to antimicrobial drugs, and inconsistent treatment policy guidelines. Seventy four per cent of patients attending an STD clinic in Kumasi self medicated with at least one antibiotic.[4] Over 90% of gonococci are resistant to commonly used antibiotics—for example, penicillin, tetracycline, and co-trimoxazole; 95% or more are sensitive to newer antibiotics—norfloxacin, cefuroxime, and ceftriaxone.[5]

Earlier treatment guidelines recommended penicillin or tetracycline for male urethral discharge as these drugs were cheap, easily available, safe and, perhaps, effective. These guidelines conformed to a national policy which determined what specific drugs could be prescribed by clinicians (who were mostly medical assistants) at peripheral health facilities. Interestingly, the current treatment guidelines[6] recommend drugs (for example, ceftriaxone for male urethral discharge) which are neither included in the national essential drugs list nor recommended for use at middle level health facilities. These inconsistencies call for a revision of the national drug policies.

The lack of adequate laboratory facilities in Ghana has also led to a situation where the WHO recommended drugs[7] are essentially adopted for the national treatment guidelines although other alternatives may be cheaper, more effective, and easily available. A recent evaluation of treatment guidelines for STDs in Zambia revealed a 69·4% cure rate for male genital ulcers owing to a decreased sensitivity of *Haemophilus ducreyi* to trimethoprim-sulpha.[8] Regional or provincial hospitals in developing countries where adequate